a. Sinusoidal DT signal

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```
clc;

clear all;

close all;

N = input ('Enter Number of Samples: ');

n = 0:0.1: N;

x = sin(n);

stem (n,x);

label ('Time');

label ('Amplitude');

title ('Discrete Time Sine Signal');

grid on;
```

هذا الكود هو عبارة عن برنامج

MATLAB لرسم إشارة متناوبة (sinusoidal) في المجال الزمني المتقطع (Discrete Time).

This code is a MATLAB program for plotting a sinusoidal signal in the discrete-time domain.

Let's explain the steps in detail:

clc;, clear all;, close all;: These commands clear the workspace, remove any stored variables in memory, and close all active plots.

N = input('Enter Number of Samples : ');: This line prompts the user to input the number of samples they want to generate. The number of samples represents the total length of the sinusoidal signal.

n = 0:0.1:N;: This line creates a variable n containing a range of values from 0 to N with a step of 0.1. This generates the time points at which the signal will be plotted.

x = sin(n);: It computes the sine function values for each value of n, giving us the sinusoidal signal values at each time point.

stem(n,x);: It plots the sinusoidal signal using stem points on the x and y axes. The x values represent time, and the y values represent the sinusoidal signal values.

xlabel('Time'); ylabel('Amplitude');: It adds labels to the x-axis and y-axis of the plot to indicate their meanings.

title('Discrete Time Sine Signal');: It adds a title to the plot indicating the nature of the plotted signal.

grid on;: It displays a grid on the plot to facilitate reading.

This is a summary of the code and its explanation. If you have any further questions, feel free to ask.